

VACUUM SWEEPER BRUSHROLL WITH MAGNET ASSEMBLY

Technical Field

[0001] The present invention relates generally to vacuum sweepers, and more specifically to a vacuum sweeper brushroll which carries a magnet for activating an indicator on the sweeper, such as an LED light, during rotation of the brushroll.

Background Art

[0002] Some electric vacuum sweepers include an LED light which is activated by a magnet carried by the brushroll. The purpose of the LED light is to provide a visual indication that the brushroll is rotating properly.

[0003] A conventional brushroll magnet assembly comprises a molded plastic ring having at least one pocket which contains a magnet. If desired, the molded ring may have one or more pockets that are rotationally opposed to the magnet and carry counter weights. The molded ring containing the preassembled magnets and counter weights is press fitted over an end of the brushroll. In an attempt to assure a tight fit and prevent relative rotation of the ring and the brushroll which may rotate at a speed of 5000 rpm, it has been conventional to form the molded ring with ribs on its inner periphery.

[0004] The expense of molding the magnet ring adds to the cost of making the brushroll. In addition, the steps of pressing the magnets into the pockets of the ring and then press fitting the ring on the brushroll complicates the manufacturing procedure and is time consuming.

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Summary of the Invention

[0005] An object of the present invention is to provide an improved way of mounting an activation magnet in association with a vacuum sweeper brushroll that overcomes the problems of the prior art described above.

[0006] In accordance with the invention, a hole is formed in the side of spindle and a magnet suitable for activating an indicator, such as an LED sensor, is pressed into the hole so that rotation of the spindle when assembled in a vacuum sweeper can be detected by movement of the magnet past the sensor. In an exemplary embodiment, a second hole rotationally opposed to the magnet is formed in the side of the spindle and a counter weight is mounted in the second hole. The counter weight assures balanced rotation of the brushroll at high speeds.

[0007] The invention reduces the cost of making a vacuum sweeper brushroll, since it does not require a magnet carrying ring molded in a separate manufacturing operation. The manufacture of the brushroll is simplified, since all that is required is to drill a hole in spindle and press fit a suitable magnet into the hole. With the arrangement of the present invention, there is no danger of a separately molded ring loosening on the spindle as a result of high speed rotation.

[0008] Other advantages and a fuller understanding of the invention will be had from the following detailed description and the accompanying drawings.

Brief Description of the Drawings

[0009] Figure 1 is a side elevational view of a typical brushroll that includes an activation magnet according to the present invention;

[0010] Figure 2 is a fragmentary view, partially in cross-section, of a portion of the spindle indicated in Figure 1;

[0011] Figure 3 is a cross-sectional view taken in the plane 3-3 of Figure 2; and

[0012] Figure 4 diagrammatical view showing how the brushroll of the invention is mounted in a vacuum sweeper in operative association with an LED sensor and light.

Description of Preferred Embodiment

[0013] In the drawings, a typical vacuum sweeper brushroll is generally indicated by reference numeral 10. The brushroll 10 includes a spindle or dowel 20 which is usually made of wood and rows of bristle tufts 30 which agitate the carpet to loosen dirt as the brushroll is rotated. In the illustrated embodiment, the spindle 20 includes a pulley 31 at one end of the dowel.

[0014] The spindle or dowel 20 is rotatably supported at each end by end assemblies 35. The end assemblies 35 can be of any known construction such as disclosed, for example, in U.S. Patent No. 5,373,603, the disclosure of which is incorporated herein by reference. The end assemblies 35 include bearings (not shown) and end caps 36 that can be engaged in a vacuum sweeper nozzle to rotatably position the brushroll 10 in the mouth of the nozzle. The illustrated end assemblies 35 include pins 38 that are press fitted in the ends of the dowel 20.

[0015] It will be appreciated that there are many different brushroll constructions known in the art. The particular one described above and shown in the drawings is not part of the invention, and merely illustrates one known brushroll in which the invention can be used to advantage.

[0016] In accordance with the invention, a hole 40 is drilled in the side of the dowel 20 and opens on its outer surface. A ball magnet 45 is press fitted into the hole 40. If desired, a plurality of ball magnets can be inserted in side-by-side holes in the dowel 20. The ball magnet 45 is selected with a magnetic strength to activate an indicator in the sweeper. As an example, a ball magnet having a magnetic strength of 4000 Gauss has been used to activate an LED sensor; although lesser magnetic strengths are suitable depending upon the coil in the LED assembly.

[0017] As shown, it is possible to drill a hole 41 in the dowel 20 for receiving a counter weight ball 46, the hole 41 and counter weight 46 being rotationally opposed to the hole 40 and magnet 45. As in the case of the magnet 45, a plurality of side-by-side counter weights can be provided, if desired.

[0018] Referring now to Figure 4, the brushroll 10 is shown mounted in the mouth of a vacuum sweeper nozzle 50. An LED light 51 visible on the upper surface of the nozzle 50 is electrically connected to the coil (not shown) of a sensor 52 which has a pole 53 adjacent the brushroll spindle 20 and the rotation path of the magnet 45. As the brushroll 10 rotates, the ball magnet 45 passes the pole 53 of the LED assembly which causes the coil of the LED assembly to generate enough power to turn on the LED. Activation of the LED provides visual indication that the brushroll is turning.

[0019] It will be seen from the foregoing that the invention provides a unique way of activating an LED light or other indicator of a vacuum sweeper, and that the invention can be carried out faster and cheaper than the prior art arrangement wherein a magnet is carried in a separately molded ring press fitted onto the brushroll spindle. The need for a separately molded part is eliminated, and all that is necessary is to drill a hole in the spindle and press a ball magnet into the hole. This arrangement also avoids the danger of a molded ring loosening on the spindle so that the spindle spins inside the ring.

[0020] Many modifications and variations of the invention will be apparent to those skilled in the art in light of the foregoing detailed disclosure. Therefore, it is to be understood, that within the scope of the appended claims, the invention can be practiced otherwise and as specifically shown and described.